



Southwest Spectro-Chem Labs

Varnish Formation Tendency




What is varnish?

Varnish is an oil-insoluble deposit composed primarily of organic residues and commonly defined by analyzed color intensity. Analytical data are combined to generate a single number representing Varnish Formation Tendency (VFT), on a scale of 0-100.

BENEFITS

- Trend the decline of anti-oxidants
- Measure soft particles (insolubles)
- Summary VFT rating on fluid condition
- Characterize the varnish potential on bearings, controllers and other crucial surfaces
- Help monitor the **Remaining Useful Life of the oil (RULer)**

*** A minimum of 8 ounces of oil is required to run a full varnish potential analysis. A new, unused reference oil is required as well.**

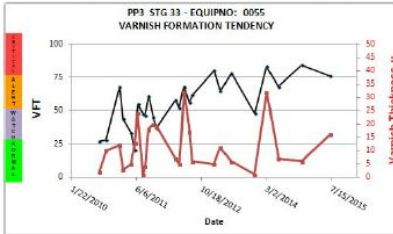


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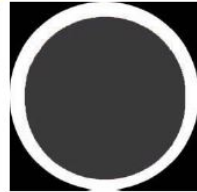
Varnish Potential
CRITICAL
VFT= 76

Varnish Analysis Report

CUSTOMER INFORMATION		LAB SAMPLE INFORMATION	
CUSTOMER #:	123456	LAB SAMPLE #:	Z0001
CUSTOMER:	Southwest Spectro-Chem Labs	OIL USED:	FYRQUEL EHC
LOCATION:	PP3	TIME ON OIL:	N/A
UNIT:	STG 33	SAMPLE DATE:	07/09/15
DESCRIPTION:	GENERATOR CONTROL OIL	REPORT DATE:	08/04/15
EQUIP NO.:	9999	ANALYST:	AZ



PP3 STG 33 EQUIPNO: 0955
VARNISH FORMATION TENDENCY



SPECTROSCOPY DATA

SILICON	0
SODIUM	273
BARIUM	0
CALCIUM	0
ZINC	1
PHOSPHOROUS	9999
MAGNESIUM	0
MONY	0
IR	0
IUM	0
DIUM	0
SSIUM	42
BDENUM	0
EL	0

Comments:
The FYRQUEL EHC is a phosphate ester that produces phenols as it degrades. The new oil does not have any phenols or amine antioxidants. The numerical value of 853.9% increase of Phenols over the reference oil is in the normal range; however, the sample is showing some degradation. This degradation is further confirmed by the color of the patch, the dark residue is varnish. The color is within the CRITICAL range and is the major cause of the overall VFT of 76. Other factors such as particle count, TAN, oxidation and nitration appear concerning as well. Actions should be taken to improve these outcomes.

Recommendation:
Monitor the oil condition on a regular monthly schedule with routine oil analysis.
The following indicators should be monitored carefully.

Equipment Operational Indicators:


- * Servos may show buildup or sticking
- * Actuators may discolor or stick
- * Vibration from bearings
- * Seals may leak
- * Increasing wear metals
- * Increasing particle count

Tank and Pump Indicators:

- * Sight and level gauges may show brown stains
- * Reservoirs may show a "bathtub" ring
- * Debris buildup on pump casing and impeller
- * Buildup on heat exchangers
- * Filters and strainers collecting brown residue

Cleaning the oil by Electrostatic filtration or Balanced Charge Agglomeration should be considered.

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The actual color (yellow, orange, green, brown to black) is not significant, only the color intensity. The darker the color, the more serious the varnish problem.
Values of VFT provide a trend to project future VARNISH formation.
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